Physics 209 Laboratory (Sections: 01, 02, 03, 04, 06, 07, & 51E)

I. Contact Information

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II. Course Prerequisites / Corequisites: Credit or registration in Physics 203 or 207

III. Course Description: Laboratory experiments in mechanics, sound, and heat to accompany 203 or 207.

IV. Course Objectives and Outcomes

The understanding of physics will be enhanced by laboratory discussions, personal reflections, observations, and experiments. The student will gain the ability to perform observations, take data, and analyze results rapidly and accurately. Skill will be developed in the use of microcomputers equipped with sensors for data collection and software for display, mathematical calculations, graphing, drawing, and the simulation of physical events and work processing.

V. Course Topics and Schedule

Meeting	Date	Activity
1	8/25 – 8/27	Measurement with Rulers, Vernier and Micrometer Calipers.
2	9/1 – 9/3	Graphical Interpretation of Motion with Motion Detectors: *Group 1*.
3	9/8 – 9/10	Graphical Interpretation of Motion with Motion Detectors: *Group 2*.
4	9/15 – 9/17	Calculating Velocity and Acceleration with a Motion Detector and Photogate.
5	9/22 – 9/24	Vectors: Graphical Method and Particle Equilibrium with a Force Table.
6	9/29 – 10/1	Experimentally Deriving Newton's 2nd Law and Experimentally Calculating the Coefficients of Static and Kinetic Friction for a Smooth Wooden Board with a Force Probe and Motion Detector.
7	**10/6 – 10/8**	***Midterm Practical Examination (material from meetings 1–5)***
8	10/13 – 10/15	Air Track – Collisions: Investigating the Conservation of Momentum and Kinetic Energy for Elastic and Inelastic Collisions with an Air Track and Photogate.
9	10/20– 10/22	Torques and Rigid Body Equilibrium.
10	10/27 – 10/29	Periodic Motion: Experimentally Calculating the Spring Constant of a Spring & Experimentally Deriving the Relationship between the Period of a Spring and the Mass and Spring Constant with a Motion Detector.
11	11/3 – 11/5	Sound and Resonance: Identifying Resonance Points for Sound Waves in Open Pipes and Calculating the Velocity of Sound.
12	11/10 – 11/12	Buoyancy and Density
13	11/17 – 11/19	Make up Labs.
	11/24 – 11/26	No Labs. Happy Thanksgiving!
14	**12/1 – 12/3**	***Final Practical Examination (material from meetings 6, 8–12)***

VI. Instructional Methods and Activities

The use of direct experience, new computer tools, and active participation will enable the student to achieve an enriched set of learning goals. In addition to mastering an important body of knowledge the student will develop reasoning ability and computer and laboratory skills.

VII. Evaluation and Grade Assignment

Laboratory reports – 70%.
Mid– term exam (**Practical**) – 15%.
Final exam (**Practical**) – 15%.

Grades will be assigned as follows:

Greater than or equal to 90% is an **A**,
Greater than or equal to 80% and less than 90% is a **B**,
Greater than or equal to 70% and less than 80% is a **C**,
Greater than or equal to 60% and less than 70% is a **D**,
Less than 60% is a **F**.

VIII. Class Policies and Procedures

At a minimum, all policies stated in the current ULM *Student Policy Manual & Organizational Handbook* should be followed (see *http://www.ulm.edu/studentpolicy/*). Additional class policies include:

A. Textbook(s) and Materials: Each student must print out the lab report posted on *Moodle* **prior to** attending lab each week.

B. Attendance Policy: Students are required to attend all laboratory meetings and exam dates. Student must make all arrangements for make–up exams or laboratories. Make–ups are only permitted with prior approval of the instructor and only for absences excused by the instructor. Any student absent for more than 25% of the total number of class meetings must withdraw from this course. Therefore, one is permitted three (3) absences. The fourth (4^{th}) absence will require a student to drop this lab.

C. Make-up Policy: (Describe policies for late assignments, make-up procedures, etc.)

D. Academic Integrity: Faculty and students must observe the ULM published policy on Academic Dishonesty (see Page 4 in ULM *Student Policy Manual* -- http://www.ulm.edu/studentpolicy/). (Also, include any additional policy information.)

E. Course Evaluation Policy: At a minimum, students are expected to complete the on-line course evaluation. (Also, include any additional course-specific policies related to evaluation of the course.)

F. Student Services: Information about ULM student services, such as Student Success Center (http://www.ulm.edu/cass/), Counseling Center (http://www.ulm.edu/counselingcenter/), Special Needs (http://www.ulm.edu/counselingcenter/special.htm), and Student Health Services, is available at the following Student Services web site *http://www.ulm.edu/studentaffairs/*.

G. Emergency Procedures: All laboratory experiments are to be conducted under the supervision of a faculty member and any safety problems are to be reported to that faculty member immediately.

H. Discipline/Course Specific Policies: Absolutely no tobacco, food, drink, or foul language is permitted in the laboratory. Students are required to turn off any personal electronic devices such as cellular phones, beepers, mp3players, video games, etc.

IX. Important Dates

DROP DATE (with a "W"): Monday, November 2, 2009

Mid–Term Grading: Mid–term grades will be posted from Monday, October 5^{th} through Friday, October 16^{th}.